

CLAIMS

1. Process for the production of metal salts of trifluoromethane sulphonic acid comprising at least one trifluoromethane sulphonic acid group by reacting
5 trifluoromethane sulphonic acid $\text{CF}_3\text{SO}_3\text{H}$ with a metal alcoholate, optionally in the presence of a solvent, at a temperature of -40°C to $+100^\circ\text{C}$, the metal being Li, Na, K, Ba, Mg, Ca, Al, In, Sn, Sc, Y, La, Ti, Zr, Fe, Cu, Ag or Zn, preferably Al, Ti or Zr and the alcoholate group(s) of the metal alcoholate comprising independent of each other 1 to 28 carbon atoms as well as
10 optionally hydroxy groups ($-\text{OH}$), ether bonds ($\text{C}-\text{O}-\text{C}$) and/or more than one alcoholate bond ($\text{M}-\text{O}-$).
2. Process according to claim 1 characterised in that the metal salt of the trifluoromethane sulphonic acid is
15 $(\text{CF}_3\text{SO}_3)_m \text{M} (\text{OR})_n$
wherein
the sum of $(m+n)$ corresponds to the valency of the metal cation and m is at least 1,
R is a hydrocarbon moiety with 1 to 6 carbon atoms and, optionally ether
20 bonds ($\text{C}-\text{O}-\text{C}$) or
is hydrogen and R can be different for each n and
M is Mg, Ca, Al, Si, Sn, La, Ti, Zr, Cu or Zn.
3. Process according to one of the preceding claims characterised in that the
25 solvent is an alcohol, an aliphatic and/or aromatic hydrocarbon, an ether and/or a ketone, with 2 to 32 carbon atoms respectively, or water or their mixtures.
4. Process according to one of the preceding claims characterised in that the
30 trifluoromethane sulphonic acid, optionally diluted with a solvent, is added to the metal alcoholate, optionally diluted with a solvent.
5. Process according to at least one of claims 1 to 3 characterised in that the
35 metal alcoholate, optionally diluted with a solvent, is added to the trifluoromethane sulphonic acid, optionally diluted with a solvent.

6. Use of metal salts of trifluoromethane sulphonic acid exhibiting at least one trifluoromethane sulphonic acid group as esterification catalyst for the production of hydroxycarboxylic acid esters by reacting one or several hydroxycarboxylic acids with one or several alcohols.
7. Use according to claim 6 characterised in that the metal salts of the trifluoromethane sulphonic acid comprise Li, Na, K, Ba, Mg, Ca, Al, In, Sn, Sc, Y, La, Ti, Zr, Fe, Cu, Ag or Zn as metal, preferably Al, Ti or Zr.
8. Use according to at least one of claims 6 or 7 characterised in that the alcohols exhibit 1 to 28 carbon atoms and, optionally furthermore 1 to 8 ether groups and/or further 1 to 5 hydroxy groups.
9. Use according to one of claims 6 to 8 characterised in that the esterification is carried out at temperatures of 60 to 250 °C and, independently thereof, at pressures of 0.2 to 10 bar.
10. Use according to at least one of claims 6 to 9 characterised in that the esterification is carried out in the presence of an entrainer and water is removed by azeotropic distillation, the entrainer being preferably an aliphatic hydrocarbon, an aromatic hydrocarbon, a dialkyl ether or an alcohol, preferably the alcohol used for the esterification itself and/or its/their mixture.
11. Use according to at least one of claims 6 to 10 characterised in that the molar ratio of the alcohol used to the carbonyl groups of the hydroxycarboxylic acid used is from 1 : 0.5 to 4.0, preferably 1.0 to 2.0.
12. Use according to at least one of claims 6 to 11 characterised in that the catalyst is used in a quantity of 0.05 to 1.0 % by weight, based on the hydroxycarboxylic acid used.
13. Use according to at least one of claims 6 to 12 characterised in that the esterification is terminated by treating the crude product with metal alcoholates, alkali hydroxides or alkaline earth hydroxides and subsequently worked up by distillation.

14. Use of metal salts of trifluoromethane sulphonic acid exhibiting at least one trifluoromethane sulphonic acid group as a transesterification catalyst for the production of hydroxycarboxylic acid esters by transesterification of a hydroxycarboxylic acid ester with at least one hydroxy group and at least one carboxylic acid ester group (-COO-), optionally having free carboxylic acid groups,
with an alcohol and/or another ester,
whereby at least one alcohol is removed from the reaction mixture.
15. Use according to claim 14 characterised in that the metal salts of trifluoromethane sulphonic acid exhibit Li, Na, K, Ba, Mg, Ca, Al, In, Sn, Sc, Y, La, Ti, Zr, Fe, Cu, Ag or Zn as metal, preferably Al, Ti or Zr.
16. Use according to at least one of claims 14 or 15 characterised in that the alcohols used comprise 1 to 28 carbon atoms and, optionally 1 to 8 ether groups and/or further 1 to 5 hydroxy groups.
17. Use according to one of claims 14 to 16 characterised in that the transesterification is carried out at temperatures of 60 to 250 °C and, independently thereof, at pressures of 0.05 to 10 bar.
18. Use according to at least one of claims 14 to 17 characterised in that the molar ratio of the alcohol employed relative to the ester groups of the hydroxycarboxylic acid ester to be converted is from 0.5 to 2.0.
19. Use according to one of claims 14 to 18 characterised in that the catalyst is used in a quantity of 0.02 to 1.0 % by weight, based on the hydroxycarboxylic acid ester to be converted.
20. Use according to one of claims 6 to 19 characterised in that the work-up of the hydroxycarboxylic acid ester takes place by distillation at temperatures in the range of 60 °C to 250 °C and pressures of 1 hPa to 1013 hPa or by stripping with a water vapour steam at temperatures of 120 °C to 200 °C and pressures of 1 hPa to 1013 hPa, in particular directly from the crude product or after removal of the catalyst and filtration of the crude product.

21. Use according to claim 20 characterised in that the distillative work-up takes place after prior removal of the catalyst with activated carbon, aluminium hydroxide or aluminosilicate.

5 22. Use according to any of claims 6 to 21 wherein the metal salts of trifluoromethane sulphonic acid are used in the presence of water.

10 23. Use according to claim 22 wherein the metal salts of trifluoromethane sulphonic acid are used in an aqueous environment comprising water, in particular as solvent or diluent, in addition to any water being formed in the course of the reaction.

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